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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,847	08/06/2004	Anil K. Chinthakindi	BUR920040112US1	6756

45601 7590 01/26/2007  
SCULLY, SCOTT, MURPHY & PRESSNER  
400 GARDEN CITY PLAZA  
GARDEN CITY, NY 11530

EXAMINER
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CHIU, TSZ K

ART UNIT	PAPER NUMBER
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2822

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/26/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/710,847

Applicant(s)

CHINTHAKINDI ET AL.

Examiner

Tsz K. Chiu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1-3, 5-8, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Wu (6,586,311).

With respect to claim 1, Wu discloses a semiconductor substrate including at least one front-end-of-the-line device (Figure 4) located on a surface thereof, at least one metal resistor (Figure 8) located on, or in close proximity to, said surface of said semiconductor substrate (400, For example Fig. 8), said at least one metal resistor (Figure 8) comprising at least a conductive metal (430, For example Fig. 8), and first level of metallization (700, For example Fig. 9) above said at least one metal resistor.

With respect to claim 2, Wu discloses a trench isolation region (460, For example Fig. 9) in said semiconductor substrate (400, For example Fig. 9), and said at least one metal resistor (640, 540, For example Fig. 9) is positioned on said trench isolation region (460, For example Fig. 9).

With respect to claim 3, Wu discloses conductive metal comprises Ta, TaN, Ti, TiN, W, WN, Nicr, Sicr or a metal silicide (Column 7, lines 9).

With respect to claim 5, Wu discloses conductive metal has a thickness from about 20 to about 50 nm (column 5, lines 46-48 and 54-56).

With respect to claim 6, Wu discloses an etch stop layer (540, For example Fig. 10) located beneath said conductive metal.

With respect to claim 7, Wu discloses etch stop layer has a thickness from about 20 to about 50 nm (column 5, lines 30-32).

With respect to claim 8, Wu discloses a dielectric material (450, For example Fig. 4) on said at least one metal resistor.

With respect to claim 10, Wu discloses at least one FEOL device comprises a field effect transistor, a bipolar transistor, a BiCMOS device, or a passive device (920 as drain/source, 915 as gate of the transistor, For example Fig. 10).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in view of Osanai et al. (6,777,752).

With respect to claim 4, Wu discloses the invention set forth in claim 1 but did not disclose conductive metal comprises TiN, TaN, Nicr or Sigr.

Osanai discloses conductive metal comprises TiN, TaN, Nicr or Sigr (Column 50, lines 12-19).

Since Wu and Osanai are both from the same field of manufacturing a semiconductor device, the purpose disclosed by Osanai would have been recognized in the pertinent art of Wu.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have use Osanai Titanium nitride in Wu conductive member, Titanium silicide, for the purpose of using titanium nitride an excellent combination of performance properties, attractive appearance, and safety, also maintaining sharp edges or corners prevent galling, seizing or cold-welding and withstands high temperatures.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in view of Erdeljac et al. (5,554,873).

With respect to claim 9, Wu discloses the invention set forth in claim 1 but did not disclose first level of metallization comprises an inter-level dielectric material having contact openings that are filled with a conductive material.

Erdeljac discloses first level of metallization (54, For example Fig. 11) comprises an inter-level dielectric material (52, For example Fig. 11) having contact openings that are filled with a conductive material (54, For example Fig. 11).

Since Wu and Erdeljac are both from the same field of manufacturing a semiconductor device, the purpose disclosed by Erdeljac would have been recognized in the pertinent art of Wu.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have use Erdeljac contact metal with a dielectric

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material opening in Wu invention for the purpose of having a contact metal with dielectric layer in between can prevent short circuit when connecting the device and also less complicated to reach to the device and with the contact metal it can have more layer forming on top of the device so that more space can be use.

### ***Response to Arguments***

Applicant's arguments, see page 5-8, filed 9/25/06, with respect to the rejection(s) of claim(s) 1-10 under 102&103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Wu (6586311).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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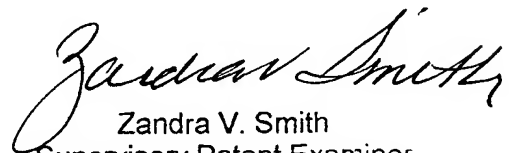
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tsz K. Chiu whose telephone number is 517-272-8656. The examiner can normally be reached on 0800 to 1700.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra V. Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC  
January 10, 2007

  
Zandra V. Smith  
Supervisory Patent Examiner  
12 Jan. 2007